UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/782,552	02/13/2001	Hyun Soo Kang	8255.51US01	9696

23552	7590	03/14/2005

MERCHANT & GOULD PC
P.O. BOX 2903
MINNEAPOLIS, MN 55402-0903

EXAMINER
WONG, ALLEN C

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 03/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	09/782,552	KANG ET AL.
	Examiner	**Art Unit**	
	Allen Wong	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on _27 September 2004_.

2a) ☒ This action is **FINAL**.   2b) ☐ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) _1-12_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) _1-12_ is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☒ All   b)☐ Some * c)☐ None of:

        1.☒ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1.   Applicant's arguments filed 9/27/04 have been fully considered but they are not

persuasive.

The previous claim objections to claims 2, 3, 10 and 11 have been withdrawn

after the changes were made.

Regarding lines 19-21 on page 6 of applicant's remarks, applicant asserts that

Hatano does not disclose "obtaining a predicted motion vector on the basis of motion

vectors of blocks surrounding a block to be currently coded", as disclosed in claim 1.

The examiner respectfully disagrees.   Element 3a of Hatano's fig.11 is a device that

produces the predicted image motion vector 110 from the motion vector of blocks being

previously stored in memory 16. Thus, Hatano discloses "obtaining a predicted motion

vector on the basis of motion vectors of blocks surrounding a block to be currently

coded".

Regarding lines 8-9 on page 7 of applicant's remarks, applicant contends that

Hatano does not disclose or suggest the steps c-g of claim 1. The examiner

respectfully disagrees. See the rejection below. Hatano's element 7b of fig.10

compares the motion compensated error of the zero vector with a first predetermined

threshold value. Hatano's col.25, ln.35-62 discloses that elements 7f and 7b of fig.11

are taken into consideration to see if the zero vector motion compensated error is

smaller than the threshold value, and thus element 4c will output the final motion vector.

Thus, a comparison of the motion compensated error of the predicted motion vector

with a second predetermined threshold value if it is determined at the comparison of the

motion compensated error of the zero vector with a first predetermined threshold value

that said motion compensated error of said zero vector is not smaller than said first

predetermined threshold value.

Regarding lines 26-27 on page 7 of applicant's remarks, applicant states that

Hatano does not disclose a motion vector selector, as disclosed by claim 5. The

examiner respectfully disagrees. As stated before, Hatano's col.25, ln.35-62 discloses

that elements 7f and 7b of fig.11 are taken into consideration to see if the zero vector

motion compensated error is smaller than the threshold value, and thus element 4c will

output the final motion vector. Thus, a comparison of the motion compensated error of

the predicted motion vector with a second predetermined threshold value if it is

determined at the comparison of the motion compensated error of the zero vector with a

first predetermined threshold value that said motion compensated error of said zero

vector is not smaller than said first predetermined threshold value.

Regarding lines 15-16 on page 8 of applicant's remarks, applicant states that

Hatano does not disclose the first and second comparators. The examiner respectfully

disagrees. The elements 7e and 7f of Hatano's fig.11 are the first and second

comparators since these elements 7e and 7f are used for comparing values,

compensated error values. Thus, Hatano teaches the first and second comparators.

Regarding lines 25-27 on page 8 of applicant's remarks, applicant argues that

the combination of Hatano and Eifrig does not render claims 2 and 10 obvious. The

examiner respectfully disagrees. Since Hatano does teach the broadly claimed

limitations of claims 1 and 5, the combination of Hatano and Eifrig is considered to be

reasonable. Hatano discloses motion vector estimation (fig.11). Hatano fails to

disclose the determination of a median value of motion vectors using the equation

MVP=MED (MV1, MV2, MV3). Eifrig teaches determination of a median value of motion

vectors using the equation *MVP=MED (MV1, MV2, MV3)* (col.14, ln.4-9). Therefore, it

would have been obvious to one of ordinary skill in the art to incorporate the teachings

of Hatano and Eifrig for accurately coding image data so as to efficiently process high

quality image display, as disclosed in Eifrig col.2, ln.16-17.

Regarding lines 1-6 on page 9 of applicant's remarks, applicant states that there

is no suggestion to combine Hatano with Eifrig. The examiner respectfully disagrees.

In response to applicant's argument that there is no suggestion to combine the

references, the examiner recognizes that obviousness can only be established by

combining or modifying the teachings of the prior art to produce the claimed invention

where there is some teaching, suggestion, or motivation to do so found either in the

references themselves or in the knowledge generally available to one of ordinary skill in

the art. See In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and In re

Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it would have

been obvious to one of ordinary skill in the art to incorporate the teachings of Hatano

and Eifrig for accurately coding image data so as to efficiently process high quality

image display, as disclosed in Eifrig col.2, ln.16-17.

Regarding lines 12-13 on page 9 of applicant's remarks, applicant asserts that

the combination of Hatano and Sun does not render claims 3 and 11 obvious. The

examiner respectfully disagrees. Since Hatano does teach the broadly claimed

limitations of claims 1 and 5, the combination of Hatano and Sun is considered to be

reasonable. Hatano discloses the calculation of the sum of squares of differences or

the SAD (col.28, ln.12-30). Hatano does not specifically disclose the equation for

calculating the SAD in the manner as described in claims 3 and 11. However, Sun

teaches the calculation of the SAD (col.2, ln.24-40; note the equation is similar to the

equation disclosed in claims 3 and 11 where the limits of i and j are from 0 to 15, and

that one can manipulate the equation shown in Sun to obtain the equation in the

claims). Therefore, it would have been obvious to one of ordinary skill in the art to

combine the teachings of Hatano and Sun for obtaining the equation to calculate the

well known concept of a sum of absolute differences so as to accurately, efficiently

estimate motion information in image data in a robust, precise manner, as disclosed in

Sun's col.2, ln.17-21.

Regarding lines 15-17 on page 9 of applicant's remarks, applicant mentions that

there is no motivation to combine the teachings of Hatano and Sun. The examiner

respectfully disagrees. In response to applicant's argument that there is no suggestion

to combine the references, the examiner recognizes that obviousness can only be

established by combining or modifying the teachings of the prior art to produce the

claimed invention where there is some teaching, suggestion, or motivation to do so

found either in the references themselves or in the knowledge generally available to one

of ordinary skill in the art. See In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir.

1988) and In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, it

would have been obvious to one of ordinary skill in the art to combine the teachings of

Hatano and Sun for obtaining the equation to calculate the well known concept of a sum

of absolute differences so as to accurately, efficiently estimate motion information in

image data in a robust, precise manner, as disclosed in Sun's col.2, ln.17-21.

In conclusion, since the broadly claimed limitations are met by the teachings, the

rejection of claims 1-12 is maintained.

Claim Rejections - 35 USC § 102

1.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act

of 1999 (AIPA) and the Intellectual Property and High Technology Technical

Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting

directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior

to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

2.   Claims 1, 4-9 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by

Hatano (6,091,460).

Regarding claim 1, Hatano discloses a motion vector estimation method

comprising the steps of:

a) obtaining a predicted motion vector on the basis of motion vectors of blocks surrounding a block to be currently coded (fig.11, element 3a produces predicted image motion vector 110 from the motion vector of blocks being previously stored in memory 16);

b) searching for a motion vector with a minimum motion compensated error and, meanwhile, obtaining the minimum motion compensated error, a motion compensated error of a zero vector and a motion compensated error of said predicted motion vector (fig.11, element 3a searches for motion vector with the least amount of error or distortion and col.25, ln.35-62 discloses obtaining the motion compensated errors and the minimum errors);

c) comparing said motion compensated error of said zero vector with a first predetermined threshold value (fig.10, element 7b);

d) determining said zero vector as a final motion vector if it is determined at said step c) that said motion compensated error of said zero vector is smaller than said first predetermined threshold value (col.25, ln.35-62 and fig.11, note elements 7f and 7b are taken into consideration to see if the zero vector motion compensated error is smaller than the threshold value, and thus element 4c will output the final motion vector);

e) comparing said motion compensated error of said predicted motion vector with a second predetermined threshold value if it is determined at said step c) that said motion compensated error of said zero vector is not smaller than said first predetermined threshold value (col.25, ln.35-62 and fig.11, note elements 7f and 7b

are taken into consideration to compare values if the zero vector motion compensated error is not smaller than the threshold value, and thus element 4c will output the final motion vector);

f) determining said predicted motion vector as said final motion vector if it is determined at said step e) that said motion compensated error of said predicted motion vector is smaller than said second predetermined threshold value (col.25, ln.35-62 and fig.11, note elements 7f and 7b are taken into consideration to compare values if the zero vector motion compensated error is not smaller than the threshold value, and thus element 4c will output the final motion vector); and

g) determining said motion vector with the minimum motion compensated error as said final motion vector if it is determined at said step e) that said motion compensated error of said predicted motion vector is not smaller than said second predetermined threshold value (col.25, ln.35-62 and fig.11, note elements 7f and 7b are taken into consideration to compare values if the zero vector motion compensated error is not smaller than the threshold value, and thus element 4c will output the final motion vector).

Note claims 8-9 have similar corresponding elements.

Regarding claims 4 and 12, Hatano discloses the use of a full search method (fig.11, note all of the candidate motion vectors are sent into element 3a).

Regarding claim 5, Hatano discloses a motion vector estimation device comprising:

a motion vector predictor for obtaining a predicted motion vector on the basis of

motion vectors of blocks surrounding a block to be currently coded, stored in a motion

vector memory (fig.11, element 3a produces predicted image motion vector 110 from

the motion vector of blocks being previously stored in memory 16);

a motion vector searcher for searching for a motion vector with a minimum

motion compensated error using a current frame and a reference frame and,

meanwhile, obtaining the minimum motion compensated error, a motion compensated

error of a zero vector and a motion compensated error of said predicted motion vector

(fig.11, element 3a searches for motion vector with the least amount of error or

distortion and col.25, ln.35-62 discloses obtaining the motion compensated errors and

the minimum errors);

a motion vector selector for receiving said motion vector with the minimum

motion compensated error, said minimum motion compensated error, said motion

compensated error of said zero vector and said motion compensated error of said

predicted motion vector from said motion vector searcher, said predicted motion

vector from said motion vector predictor and first and second threshold values

and then determining a final motion vector using the received information (fig.11,

element 4c is the motion vector selector; and in col.25, ln.35-62 and fig.11, note

elements 7f and 7b are taken into consideration to compare values if the zero vector

motion compensated error is not smaller than the threshold value, and thus element 4c

will selectively output the final motion vector); and

said motion vector memory adapted to receive and store the final motion vector

determined by said motion vector selector (fig.11, element 16 and also note the fig.16,

element 17b is the motion compensation prediction circuit that has an output that goes

to memory element 16).

Regarding claim 6, Hatano discloses the first motion compensated error

calculator (fig.11, element 5a) and the second motion compensated error calculator

(fig.11, element 5b).

Regarding claim 7, Hatano discloses the first comparator (fig.11, element 7e), the

second comparator (fig.11, element 7f), the first switch (fig.11, element 4c) and the

second switch (fig.11, element 4d).

Claim Rejections - 35 USC § 103

3.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4.   Claims 2 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Hatano (6,091,460) in view of Eifrig (6,005,980).

Hatano discloses motion vector estimation (fig.11). Hatano fails to disclose the

determination of a median value of motion vectors using the equation $MVP=MED$ *(MV1,*

MV2, MV3). However, Eifrig teaches determination of a median value of motion vectors

using the equation $MVP=MED$ *(MV1, MV2, MV3)* (col.14, ln.4-9). Therefore, it would

have been obvious to one of ordinary skill in the art to incorporate the teachings of

Hatano and Eifrig for accurately coding image data so as to efficiently process high quality image display (Eifrig col.2, ln.16-17).

Claims 3 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hatano (6,091,460) in view of Sun (6,014,181).

Hatano discloses the calculation of the sum of squares of differences or the SAD (col.28, ln.12-30). Hatano does not specifically disclose the equation for calculating the SAD in the manner as described in claims 3 and 11. However, Sun teaches the calculation of the SAD (col.2, ln.24-40; note the equation is similar to the equation disclosed in claims 3 and 11 where the limits of i and j are from 0 to 15, and that one can manipulate the equation shown in Sun to obtain the equation in the claims). Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Hatano and Sun for obtaining the equation to calculate the well known concept of a sum of absolute differences so as to accurately, efficiently estimate motion information in image data in a robust, precise manner (col.2, ln.17-21).

Conclusion

5.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the mailing date of this final action.

Contact Information

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Allen Wong whose telephone number is (703) 306-5978.

The examiner can normally be reached on Mondays to Thursdays from 8am-6pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Christopher Kelley can be reached on (703) 305-4856. The fax phone

number for the organization where this application or proceeding is assigned is 703-

872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Allen Wong
Examiner
Art Unit 2613

AW
3/2/05